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Final Basis of Design Report

McCormick & Baxter Creosoting Company
Portland Plant
Portland, Oregon

Task Order No.: 88-97-5

May 1998

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Prepared for:

Waste Management & Cleanup Division
Dept of Environmental Quality

STATE OF OREGON
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Introduction

Ecology and Environment, Inc. (E & E), under contract with the Oregon Department of Environmental Quality (DEQ), has prepared this Basis of Design (BOD) report in support of the remedial design (RD) for contaminated soil at the McCormick & Baxter Creosoting Company Portland Plant (McCormick & Baxter) site in Portland, Oregon.

This document has been prepared under DEQ Task Order No. 88-97-5. The purpose of the task order is to conduct RD and remedial action (RA) activities at the site in accordance with the remedy described in the Record of Decision (ROD; EPA/DEQ 1996) and the March 1998 ROD Amendment (EPA/DEQ 1998). The ROD identifies remedies for soil, sediment, and groundwater contaminated primarily with carcinogenic polycyclic aromatic hydrocarbons (cPAH), pentachlorophenol (PCP), arsenic, and polychlorinated dibenzo-*p*-dioxins and dibenzofurans (dioxin/furans).

A detailed site description and history, a summary of RD data collection field activities, a discussion of cleanup goals, the nature and extent of contamination, and design criteria are presented in the Revised Final Remedial Design Data Summary Report (E & E 1998) submitted to DEQ in November 1997. This BOD report has been developed in accordance with EPA RD/RA guidance (EPA Document No. 540/R-95/059). This report assembles functional and technical requirements that will be used in preparing project plans and specifications for the site RA. Section 2 contains information on applicable standards of performance, project scope of work, and design provisions for each component of the RA including site preparation and mobilization, demolition/debris removal, soil excavation, off-site transportation, off-site disposal, and new site features. Section 3 discusses administrative tasks including permitting procedures and access requirements; Section 4 presents the contracting strategy; and Section 5 details the RA schedule and discusses the cost estimate which is included in Appendix A.

The BOD is a working document and will be revised following the Pre-final Design meetings with DEQ and EPA. This report will be resubmitted in final form with the Final design document in May, 1998.

This section of the BOD report describes technical approaches, design objectives, design provisions, and construction requirements for each of the following major components of the soil remedy:

- Demolition and off-site disposal or recycling of targeted surface and subsurface structures and debris in order to facilitate soil excavation, final site cap construction, and installation of groundwater remedy components;
- Excavation of contaminated soil that exceeds the action levels for arsenic, cPAH, and PCP, as established in the 1996 ROD (USEPA/DEQ 1996). Excavation will not exceed a depth of four (4) feet as specified in the March 1998 ROD Amendment (USEPA/DEQ 1997);
- Backfilling excavation areas with clean soil;
- Off-site treatment of excavated soil and stockpiled ACZA-treated wood that exceeds Toxicity Characteristics Leaching Procedure (TCLP) criteria for arsenic, chromium, and/or PCP as specified in the 1997 Proposed Plan for ROD Amendment;
- Off-site disposal of excavated soil and specific debris at a RCRA permitted hazardous waste disposal facility, as specified in the March 1998 ROD Amendment;
- Placement of a clean soil cap over the entire site followed by long-term monitoring and maintenance; and
- Establishment of institutional controls such as deed restrictions that would limit future land use activities at the site.

As directed by DEQ, installation of the final site cap and establishment of institutional controls will be delayed for up to two years following completion of the soil removal activities. This delay, as described in 1996 ROD, will allow integration of future site development requirements into the final cap design and will prevent destruction of the cap during installation of groundwater remedial components. As such, separation of the major soil remedy components in this manner will result in completion of the soil remedy in two phases. The initial phase, which is the focus of this BOD report, will address all the major soil remedy components except for those to be delayed as noted above. The delayed components will be addressed in the final phase of the soil remedy.

In conjunction with this BOD report, E & E is preparing Contract Documents for procurement of a remedial contractor to complete the initial phase of the soil remedy. The Contract Documents consist of bidding and contract requirements, technical specifications, construction plans and details, and any addenda to the Contract Documents. A separate set of Contract Documents will be prepared at a later date to procure a remedial contractor for construction of the final site cap.

The following sections provide a general description of the specific scope of work activities, design provisions, methods and assumptions, and special construction considerations for the soil remedy. Sections 2.1 through 2.6 detail construction preparation and mobilization, demolition and debris removal, soil excavation, transportation, off-site disposal, and new site features construction, respectively.

2.1 Construction Preparation and Mobilization

E & E anticipates that the Contractor (procured by DEQ to implement the soil activities) will be required to prepare the following pre-construction plans:

- Contractor Site Safety Plan (CSSP);
- Construction Operations Plan (COP);
- Transportation and Disposal Plan (TDP); and
- Construction Schedule.

These plans will be submitted to DEQ and E & E for approval prior to initiating any mobilization, site preparation, or construction activities. The CSSP will ensure that all personnel comply with the basic provisions of the Occupational Safety and Health Administration (OSHA) Standards (29 CFR 1910) and General Construction Standards (29 CFR 1926), including OSHA Hazardous Waste Operations and Emergency Response, Interim Final Rule (29 CFR 1910-120). The COP shall identify personnel, equipment, construction procedures, and construction quality control to be used in carrying out the requirements of the project. The TDP will describe how excavated soils, debris, and wastes will be handled on site; loaded and transported to the applicable disposal or salvage facility; and the manner in which the materials will be treated, salvaged, or disposed. The TDP will also include an Off-site Accident Contingency Plan. The Construction Schedule will provide a detailed schedule for the site work with subschedules of related activities that are essential to the construction process. The Construction Schedule will be prepared and maintained throughout work activities to assure completion of the project by April 30, 1999.

Mobilization will include transportation to the site and staging, if necessary, of all equipment, materials, and supplies required to complete the specified soil remedy. E & E anticipates site preparation activities will include installation of truck and equipment decontamination facilities, preparation of access roads, establishment of construction controls, and installation of health and safety controls.

The Contractor will furnish, install, and maintain a temporary construction trailer for use as a field office for the entire construction period. The Contractor will arrange the connection and disconnection of services to the trailer with local utility companies. At the completion of work, the field office will be removed.

Prior to initiating site work activities, the Contractor will document the condition of North Edgewater Street and North VanHouten Place from North Willamette Boulevard to the site entrance. During the site work, the Contractor will maintain the existing roads in equal or better condition and make provisions for traffic control at the North Willamette Boulevard intersections when trucks are entering or exiting the site. Improvements to the dirt site entrance road are discussed in Section 2.6. On-site, the Contractor will be responsible for spraying all gravel or dirt haul routes with water during construction activities to eliminate visible dust.

2.2 Demolition and Debris Removal

As part of the soil remedy, specific structures and debris remaining on-site will be demolished and disposed or recycled. This demolition/debris removal component of the soil remedy will make the site more amenable for soil excavation, cap construction, and future installation of groundwater remedy components. The demolition/debris removal will be included in the remedial Contractor's scope of work. The tasks to be included in the Contractor's scope of work are described in the paragraphs below:

- **ACZA-Treated Wood.** Approximately 410 cubic yards of stockpiled ACZA-treated wood (as shown on the Design Plans) remain on-site following previous demolition activities. Previous analysis of the ACZA-treated wood demonstrated that the wood exceeds the TCLP criterion for arsenic, resulting in a RCRA hazardous waste classification for disposal. As such, the wood will be loaded into lined rail containers and transported in accordance with all local, state, and federal regulations to an appropriate off-site RCRA permitted treatment, storage, and disposal (TSD) facility. Barge or truck transport of the ACZA-treated wood is prohibited. The hazardous waste debris will be treated and disposed in accordance with state and federal hazardous waste regulations.

- **Concrete.** Based on previous concrete investigations and calculations presented in the *Revised Draft Remedial Design Data Summary Report* (E & E 1997), approximately 1,320 cubic yards of existing concrete slabs, equipment pedestals, and retaining walls (as shown on the Design Plans) will be demolished. The concrete will be broken into manageable sections and placed into the existing retort pits in layers with alternating soil lifts as shown in the Design Plans. Any concrete slabs remaining after all retort pits have reached capacity will be placed in targeted excavation areas located immediately adjacent to the pit structures.
- **Railroad Track.** Approximately 24,700 linear feet of steel railroad track exists within the property boundary as determined from a previous site survey. This track is to be removed by the Contractor and subsequently salvaged at a DEQ approved metal reclamation facility. In addition, the Contractor will remove approximately 7,600 rail ties located beneath the track. The gravel ballast will remain in-place. Rail ties removed intact will be decontaminated and transported to a DEQ approved off-site permitted landfill via rail, truck, or barge. Rail tie decontamination will consist of a high pressure water wash to remove all visible soil from the tie surface. Fragmented ties or ties requiring excessive decontamination (as determined by the site engineer) will be transported via rail only and disposed as a RCRA hazardous waste.
- **Creosote-Coated Scrap Metal Debris.** Approximately five (5) cubic yards of existing stockpiled creosote-coated scrap metal debris will be removed by the Contractor and transported via rail or truck in accordance with all local, state, and federal regulations to a DEQ approved TSD facility. The hazardous waste debris will be treated and disposed in accordance with state and federal hazardous waste regulations.
- **55-Gallon Drums.** The Contractor will dispose approximately forty-five (45) existing 55-gallon drums containing F-listed RCRA hazardous waste. The drums contain a combination of spent creosote formulations, creosote-coated asbestos insulation, and investigation derived waste. The RCRA hazardous waste will be transported via rail or truck, treated, and disposed in accordance with state and federal hazardous waste regulations at a TSD facility approved by DEQ.
- **Office Building/Scale House.** The Contractor will demolish the existing office building and scale house which are composed of approximately 150 tons of wood and 12 tons of steel. Prior to demolition, an asbestos abatement of the office building will be performed by the Contractor to remove the asbestos-containing-materials described in the *Asbestos Survey Report* (PBS 1993). The Contractor, or his subcontractor, will be specifically licensed for asbestos removal work. The asbestos abatement will remove approximately 1,200 square feet of textured ceiling material, 5,550 square feet of vinyl floor tile, and 25 square feet of kitchen counter covering. The asbestos-containing-material will be transported by rail or truck and disposed in a DEQ approved off-site landfill permitted to accept asbestos-containing-materials. E & E anticipates that any recovered steel will be salvaged at a DEQ approved metal reclamation facility. Wood and any remaining construction/demolition debris will be transported by rail, truck, or barge to a DEQ approved off-site permitted landfill for disposal.

- **Storage Tanks.** Three (3) insulated polyethylene storage tanks located in the site parking lot will be dismantled and decontaminated by the Contractor. In addition, the Contractor will decontaminate ten (10) 55-gallon polyethylene drums. It is believed that the tanks and drums formerly contained acidic and inorganic compounds not related to historic site operations. The decontamination liquid will be contained and characterized for appropriate disposal in accordance with state and federal hazardous waste regulations. The decontaminated tank sections and drums will be transported by rail or truck and disposed in a DEQ approved off-site landfill.
- **Piping, Pilings, and Utility Poles.** The Contractor will remove all stormwater catch basins and associated underground piping, abandoned underground creosote piping, buried pilings, and unused utility poles (as shown on the Design Plans). The stormwater catch basins and associated metal piping will be decontaminated and transported via rail, truck, or barge to a DEQ approved metal reclamation facility. The creosote piping will be disposed as a RCRA hazardous waste at a DEQ approved off-site TSD facility. Approximately 94 pilings and three (3) unused utility poles will be cut down to transportable size (as necessary), decontaminated, and transported via rail or truck to an approved off-site landfill for disposal. Decontamination of these materials will consist of high pressure water wash to remove all visible soil from the materials' surface.
- **Log Loader and Creosote Dock.** The Contractor will dismantle the existing log loader and creosote dock by saw-cutting into manageable sections. A land-based or barge-based crane may be used for section removal. All log loader pilings and creosote pilings will remain in place, exposed 12" - 18" above ground surface and above typical high water level, respectively, and painted yellow. The dismantled sections shall be transported by rail or barge and disposed at a DEQ-approved off-site landfill. Truck transport shall be prohibited to reduce truck traffic through nearby neighborhoods.

The Contractor will provide environmental controls including dust control and erosion control, as necessary, during all demolition and removal activities. Dust suppression activities must eliminate all visible dust. The Contractor will be required to continuously monitor ambient air quality during all phases of demolition/removal, to assure protection of public health and safety. Temporary erosion control measures (e.g. swales, booms) will be used as necessary to control erosion that develops during demolition/removal activities. Excavations one foot deep or greater resulting from demolition/removal activities will be secured with a four-foot-high construction fence at the end of each work day.

2.3 Soil Excavation

2.3.1 General

The primary activities that will be completed as part of soil excavation and backfilling are:

- Excavation of approximately 17,800 cubic yards (28,500 tons) of soil from 19 remedial areas with mechanical screening of the top one-foot;
- Soil analysis to determine the extent of excavation;
- Excavation of soil from two frac tanks;
- Excavation and consolidation of soil from the site entrance roadway;
- On-site transportation of the soil and stockpiling;
- Loading of soil into railcars; and
- Backfill all excavation areas to the surrounding grade.

Delineation of the excavation areas, calculation of soil volume (and weight) and all assumptions that were used by E & E are presented in Sections 5 and 6 of the *Revised Final RD Data Summary Report* (E & E 1997). All hazardous waste soil will be hauled off-site via rail. Barge or truck transport is prohibited. Estimated excavation and backfill quantities are provided in Table 2-1 and Table 2-2.

2.3.2 Excavation Plan

Prior to excavation activities, the Contractor will establish control points for surveying the excavation areas. The past sample locations within each area that contained contaminant concentrations in excess of the action levels will be surveyed and field-staked. Using these field stakes as reference points, the E&E field engineer will establish an initial excavation area about these points. The initial excavation area will be field marked with stakes and/or paint.

Within each RA area the initial excavation area shall be excavated to one foot BGS and mechanically screened. Mechanical screening shall separate all material greater than one-inch in diameter. Unless otherwise directed by the Engineer, the screened material greater than one-inch will be stockpiled and later used as backfill material.

If the RA area is designated a one-foot excavation area, field laboratory analysis will be conducted by the Engineer after excavating and mechanical screening the initial volume as described above. Based on laboratory analysis results and engineering judgement, the Contractor may be directed to continue excavation at specified locations within the RA area (see Section 2.3.5). As necessary, excavation shall proceed vertically in a maximum one-foot

TABLE 2-1

Summary of Remedial Action Area Volumes

McCormick and Baxter Creosoting Co. Site
Portland Plant
Portland, Oregon

Units: Cubic Yards

Remedial Area	Sq. Ft. Area	1-FOOT EXCAVATIONS				4-FOOT EXCAVATIONS
		1-foot Volume	% Screen Reduction	Volume of Gravel	Volume of Screened Soil	Volume next 3 feet
RA1	11,936	442	30	133	309	
RA2	13,746	509	30	153	356	
RA3	19,362	717	30	215	502	
RA4	12,873	477	30	143	334	
RA5	5607	208	30	62	145	
RA6	11614	430	30	129	301	
RA7	5633	209	30	63	146	
RA8	10218	378	30	114	265	
RA9	2934	109	30	33	76	
RA10	2869	106	30	32	74	319
RA11	1225	45	30	14	32	
RA12	18241	676	30	203	473	2027
RA13a	4810	178	30	53	125	534
RA13b	44567	1651	30	495	1155	4952
RA14	5611	208	30	62	145	
RA15	5974	221	30	66	155	
RA16	1225	45	30	14	32	136
RA17	15728	583	30	175	408	1748
RA18	3400	126	30	38	88	378
RA19	2520	93	30	28	65	280
TOTALS		7411		2223	5188	10373

%Screen Reduction: 30

TABLE 2-2

Summary of Excavation and Backfill Materials

McCormick and Baxter Creosoting Co. Site

Portland Plant

Portland, Oregon

Units: Cubic Yards

Item	Sq. FT. Area	Total Volume	Description
Excavation			
Road Excavation	10,314	382	Sq. Ft. Area from CAD X 1 foot excavation depth
Soil in Frac Tanks		80	Estimated quantity
Soil Piles		450	Estimated quantity
Volume of pits		1331	Estimated quantity
Volume of RA Area Excavations		17784	Total Volume of 1 foot and 4 foot excavations from Table 2-1
Total Soil for Disposal		16091	1 foot Screen Volume, 4 foot Volume, Soil Piles, and Frac Tank
Backfill			
Total Volume Requiring Backfill		19115	Total Volume of Excavations, Road Excavation, Retort Pits
Backfill from Road		382	Soil consolidated on-site from Road Excavation
Backfill from landslide (8 feet high)	11,520	3413	Sq. Ft. Area X 8 ft. pile height
Backfill from Screening Gravel		2223	Quantity of gravel from Table 2-1
Backfill from Concrete Slabs		1320	Estimated quantity
Backfill from Off-site Source		11777	Total volume requiring backfill - Road, Landslide, Screened Gravel, and Concrete Slabs
Road Construction			
Road Base (12" gravel base)	10,314	382	
Road Asphalt (two course - 5" total)	10,314	159	

increment and/or laterally at an incremental minimum of two feet and maximum of 10 feet. When proceeding laterally, mechanical screening of the initial one-foot BGS shall be conducted as described above. After each excavation increment, field laboratory analysis will be conducted by the Engineer to determine if further excavation is necessary. Vertical excavation will not exceed four-foot BGS.

If the RA area is designated a four-foot excavation area, excavation of the initial targeted area shall proceed to four-foot BGS upon completion of the mechanical screening activities described above. Thereafter, the Engineer will conduct field sampling/laboratory analysis of the excavation area (see Section 2.3.5). As necessary, excavation shall proceed laterally at specified locations at an incremental minimum of two feet and a maximum of 10 feet. When proceeding laterally, the four-foot BGS maximum excavation depth shall be maintained, with mechanical screening of the top one-foot. After each incremental excavation, field laboratory analysis will be conducted by the Engineer to determine if further excavation is necessary.

In addition to the RA access, the Contractor will remove all soil from within the two frac tanks as shown on the Design Plans. The soil will be considered hazardous waste and will be handled accordingly. The Contractor will also excavate the top one-foot of soil from the roadway between the site entrance and the crossing of the Union Pacific Railroad track as shown on the Design Plans. This soil shall be consolidated on site and used as backfill. The road reconstruction is discussed in Section 2.6. All decontamination wastewater will be collected and utilized by the Contractor for on-site dust suppression. Sediment in the decontamination wastewater may be utilized as fill material after complete de-watering.

Excavation will be completed using standard earth-moving equipment such as a backhoe or front loader. Any wells or utilities not targeted for removal which are located in the excavation areas will remain in-place. Special care will be taken when excavating around each well or utility (e.g., hand digging). Any wells or utilities damaged or destroyed will be repaired or replaced by the Contractor at no expense to DEQ. If abandoned process piping is identified in any excavation, the piping will be removed and disposed as a hazardous waste.

Except for that screened soil greater than one-inch in diameter, all excavated soil will be classified as F032, F034 and F035 hazardous waste in accordance with 40 CFR 261. Soil from remedial action (RA) areas RA3 and RA12 will also be classified as D004 and D007, respectively, since soil in these areas exceeded the TCLP criteria for arsenic and chromium. Excavated soil from RA3 and RA12 will not be mixed with soil from other RA areas.

2.3.3 Soil Handling

Equipment used to haul the contaminated soil off-site will be lined with impermeable plastic liners to prevent the spread of contamination and to minimize the amount of decontamination required. Any equipment or vehicles that enter the exclusion zone will be decontaminated prior to exiting the zone. Decontamination of contaminated equipment will involve washing with a pressurized steam cleaner or water jet until all visible traces of soil are removed. Excavated soil will be transported on-site via dedicated trucks and temporarily stockpiled near the rail loading area. The stockpile area will be constructed prior to any excavation activity begins. The contaminated soil stockpiles will comply with all applicable RCRA standards. The stockpile height will not exceed 15 feet and sideslopes will not be steeper than 1V on 1.5H. The stockpile bottom will be lined with a durable, impervious material, and will be sloped one-percent or more to promote drainage to collection sump(s). Run-off control facilities around stockpiles will consist of 1-foot high lined berms with 1:1 sideslopes, designed to prevent stormwater from entering the stockpile area. The stockpiles will be completely covered with anchored tarpaulins to prevent stormwater infiltration and wind erosion.

The Contractor will provide a temporary scale or equivalent method and will document the weight of each load prior to stockpiling in order to maintain a running record of total stockpiled soil weight to prevent railcar overloading and for completion of waste shipment records. The railcars will be loaded using suitable equipment to minimize soil spillage outside the protected stockpile area. If soil falls onto unprotected areas, the soil will be immediately removed by shovels, scoops, or other suitable equipment until there is no possibility of contamination remaining, as determined by the site engineer.

Prior to leaving the site, each railcar will be cleaned first by brushing off gross contamination; then, if directed by the site engineer, will be cleaned with a pressurized steam cleaner or water jet until all visible traces of soil are removed. Each railcar will be properly covered with impervious tarpaulins or otherwise completely enclosed to prevent discharge of the soil from the railcars while in transit and to prevent rainwater from entering the railcars. Information pertaining to off-site transportation and disposal are included in Sections 2.4 and 2.5, respectively.

2.3.4 Environmental Controls

The Contractor will provide environmental controls including dust control, surface water/storm water control, and erosion control, as necessary, during all excavation, hauling, placement, and loading/unloading operations. Dust suppression activities must eliminate all

visible dust. The Contractor will be required to continuously monitor ambient air quality during all phases of excavation, to assure protection of public health and safety. Any soil stockpiled on site will be covered to prevent dispersion by wind or rain. The perimeters of the excavation areas will be graded or bermed to prevent surface water runoff into the excavation. Excessive water will not be permitted to accumulate in the excavations. At the end of each working day or at the discretion of the Engineer, geomembrane(s) will be placed within all open RA excavation areas to prevent contact of storm water with the excavation area. The geomembrane will be placed in immediate contact with the excavation bottom and walls to prevent tension if filled with storm water. The geomembrane will be sufficiently and securely anchored outside the excavation area with site soil to prevent any stormwater run on between the geomembrane and the excavation. Before resuming excavation, any water accumulated on the geomembrane will be pumped to non-working areas of the site and contained on-site with surface water control devices (e.g. berms, swales). Excavations one foot deep or greater that are unfinished will be secured with a four-foot-high construction fence the end of each work day. The work in an excavation area will not be considered complete until backfill has been placed.

2.3.5 Sampling and Laboratory Analysis

E & E will collect soil samples to conduct field laboratory analysis utilizing Ohmicron Rapid Assay field test kits to monitor the extent of excavation. The field test kits were previously used by E & E at the site during RD data collection activities. As discussed in the *Revised Draft Data Summary Report* (E & E, 1997), the field test kits will be calibrated to the site action level concentrations for accuracy. Samples will be collected by the field engineer at a frequency and spacial distribution to be specified in the Construction Management Plan. Field screening soil samples will be collected along the walls of the excavations. Soil samples will also be collected from the floor of excavations that are less than 4 feet deep. If the 4 foot excavation depth is reached, soil samples will only be collected from the excavation walls. A field chemist will conduct the soil analysis. Each sample will be field screened for arsenic, PCP, and cPAH. Upon documenting a soil sample location with analytical results less than all contaminant action levels, a confirmation soil sample will be submitted for analysis to a commercial laboratory for 24-hour turnaround analysis. All confirmation samples will be analyzed for arsenic, PCP, and cPAH. The confirmation soil sample results will be used to document completion of the excavations. All confirmation analytical results will be fully validated in accordance with the QA/QC requirements to be described in the Construction Management Plan. Data validation of the field screening results will not be required.

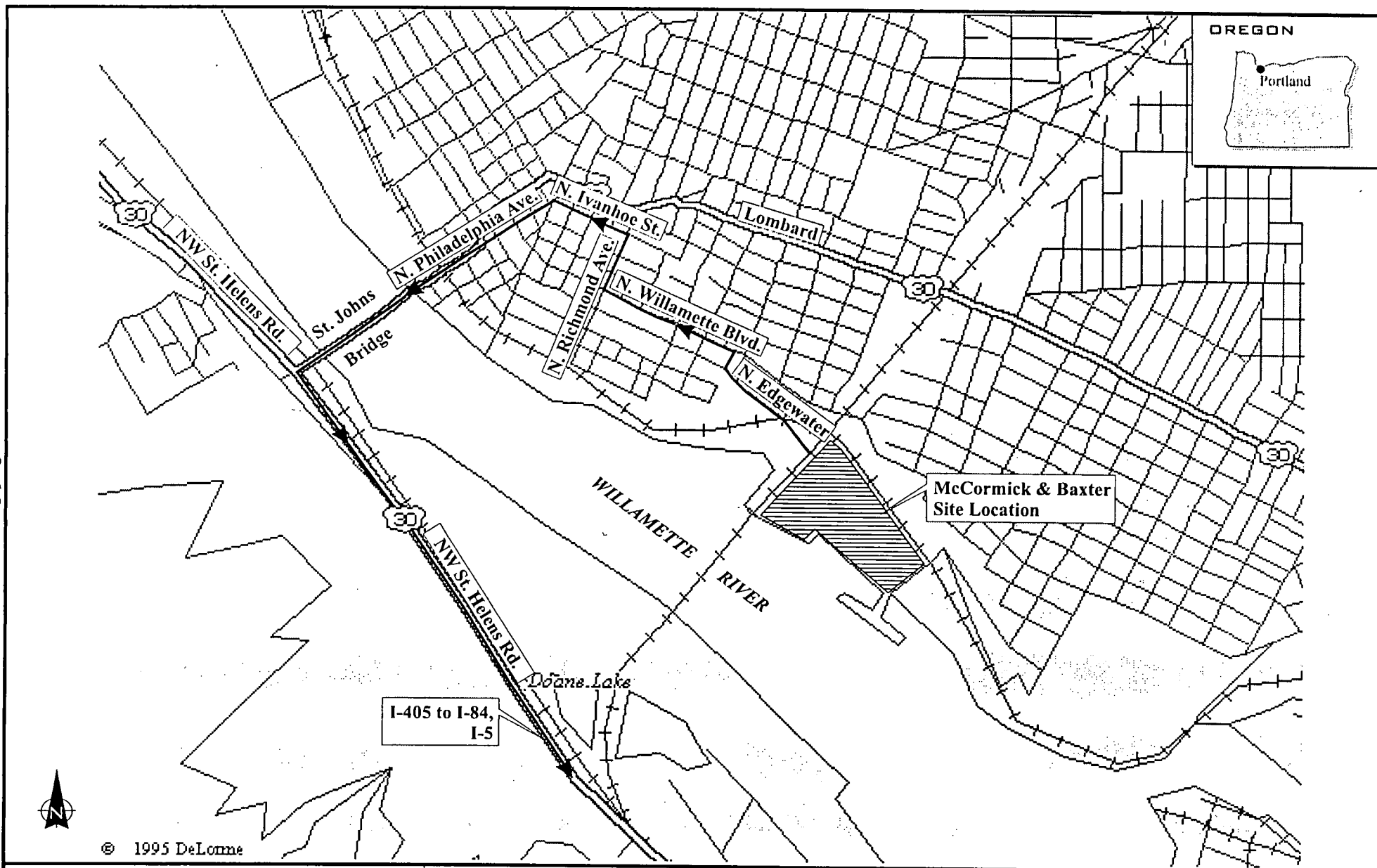
Following receipt of field screening sample analytical results, the site engineer will inform the Contractor where to continue with the excavation (if required). As soon as confirmation soil sample results indicate that the soil within the excavation is below the action levels for each contaminant, the excavation area perimeter will be field staked and a permeable geotextile demarcation liner will be placed in the excavation prior to the backfill.

2.3.6 Backfilling

The excavated areas will be backfilled to grade with clean fill material. The excavated areas will be initially backfilled with on-site soil from the 1996 landslide stockpile, mechanically screened soil greater than 1-inch, and soil from the entrance road one-foot excavation. Thereafter, clean backfill material will be imported via rail or barge from a DEQ approved off-site source. The Contractor will submit documentation to DEQ and E & E prior to hauling any off-site soil to the site to ensure that the off-site source meets the requirements specified in the Contract Documents.

2.4 Off-Site Transportation

E & E anticipates three primary modes of off-site waste transportation will be considered by the Contractor: rail, truck, and barge. All excavated soil, the ACZA wood pile, and fragmented rail ties will be transported by rail. Truck or barge transport of these materials will be prohibited. In addition, truck transport of the creosote dock and log loader will be prohibited to reduce truck traffic through residential areas; and barge transport of the creosote piping, creosote-coated scrap metal, 55-gallon drums, storage tanks, and all other materials deemed hazardous will be prohibited. Transport of all other non-hazardous materials by rail, truck, or barge will be allowed. Of the allowable transportation modes, the Contractor will decide which mode or combination of modes is most appropriate or cost effective. Supporting information and documentation will be submitted by the Contractor with the required Transportation and Disposal Plan (TDP), subject to approval by DEQ and E & E. The TDP will be submitted by the Contractor prior to mobilization. The primary items to be required in the TDP are: a detailed description of the proposed transportation means, transportation schedule, applicable standards and regulations, safety requirements, loading procedures, hauling procedures, traffic estimations, vehicle decontamination, spill prevention/response procedures, and bill of lading/manifest preparation procedures. The Contractor will be required to follow the truck route shown in Figure 2-1. The TDP will also include an Off-Site Accident Contingency Plan detailing response and clean-up procedures in the event of an off-site transportation accident.



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MCCORMICK & BAXTER CREOSOTING CO.
PORTLAND, OREGON

Source: DeLorme 1995

Figure 2-1
PROPOSED TRUCK ROUTE

Drawn:
AES

Date
4/29/98

Job No.
OH4140

Dwg.No.
OH4140F1

If barge transport is utilized for importing clean backfill material, a two-barge system consisting of a crane barge and a material barge will be used. The crane barge will be anchored with pilings set one to two feet into the river bottom. A barge loaded with backfill material (material barge) would then be positioned adjacent to the crane barge, and the soil will subsequently be transported from the material barge to the site beach via the crane barge. A conveyor system may be subsequently utilized to transport the soil from the beach to the top of the bank, where an end loader could transport the materials to the excavation areas.

The crane barge will be anchored either adjacent to the log loader or near the creosote dock bulkhead at depths which provide adequate draft space and positioned to allow the crane arm to reach beyond the shoreline. In order to minimize the potential for contaminated sediment disturbance, the Contractor will meet the following requirements:

- Only shallow draft barges and tugboats will be utilized.
- Material barge loads will be limited in order to maintain a minimum draft clearance of approximately five feet from the river bottom.
- Tugboats will always be positioned on the river side of the barges.
- Tugboat operators will be instructed to conduct all tug activities slowly and carefully in the vicinity of the site.
- Delivery of backfill via barge will be scheduled to occur within a single time frame (e.g., within two weeks) to minimize the time during which sediment could be disturbed.

The Contractor will be responsible for ensuring that all vehicles entering and leaving the site comply with applicable safety requirements, and the transportation of all materials will comply with all applicable local, state, and federal regulations. All material will be handled, loaded and transported in a manner that prevents spillage or contamination on-site or off-site. The Contractor will be responsible for soil and debris spilled on or off-site during all loading or transit activities. A rate and method of loading and transporting the material which minimizes the emissions of dust will be used at all times. Contaminated soil and debris will be loaded into suitable lined railcars or trucks and covered with a tarpaulin. Non-hazardous demolition debris will be placed in suitable containers, trucks or rail cars and secured to ensure that no items are lost during transport. Decontamination liquid generated during cleaning and dismantling of the three (3) insulated polyethylene storage tanks will be placed in suitable containers but will not be mixed with any other liquids or solids collected at the site.

All vehicles leaving the site that have come into contact with contaminated soils and all vehicles hauling soils off-site will pass through an equipment decontamination station to ensure that no soil adheres to its wheels or undercarriage. If rail transportation is utilized, the rail car exteriors will be decontaminated if loading operations spill soil onto the side of the rail car.

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Otherwise, rail cars will not need to be decontaminated. The Contractor will wash wheels and undercarriage using high pressure water, steam, or other appropriate method in order to remove soil adhering to the vehicle. Decontamination water will be collected and may be used for dust control in cleanup areas.

A Transportation Schedule will be implemented by the Contractor that allows for timely soil and debris removal at a rate commensurate with the planned excavation activities. The Contractor will be responsible for obtaining permits and authorizations necessary to use the mandated routes and will comply with restrictions imposed by local governmental agencies regarding use of the routes.

The Contractor will weigh each vehicle on-site before and after loading waste materials with a temporary scale to be provided by the Contractor. The net weight of loaded materials will be used as the measure of hazardous waste for purposes of completing hazardous waste manifests. When rail transport is employed, the Contractor will provide a temporary scale or equivalent method and will document the weight of each waste material load prior to stockpiling or railcar loading to prevent railcar overloading. When stockpiling is used prior to railcar loading, a running record of total weight per stockpile will be documented to prevent railcar overloading and for completion of waste shipment records. A manifest must be completed by each transporter prior to leaving the site. The site engineer will provide a hazardous waste generator identification number for use on the manifests (where required), and will sign each manifest as an agent for the State of Oregon, which is the generator. All manifests will be completed with all federally required information and data to be supplied by the waste generator, transporter, and the receiving facility operator. Two (2) fully executed copies of each shipment manifested will be submitted to the site engineer.

2.5 Off-Site Disposal

The Contractor will dispose of the wastes resulting from on-site activities at permitted treatment, disposal, or recycling facilities. All materials and items removed from the site will be considered waste, except decontaminated equipment and vehicles. Bidders will be required to submit the list of proposed Disposal facilities with their bid. During Bid Evaluation, DEQ will be able to check and approve the Proposed Disposal facilities. The Contractor will submit the following information for DEQ's and E & E's review:

- Name(s) and address of the facility agreeing to accept the specific waste;
- Name(s), title, address, and telephone number of individual(s) responsible for the facility's operation;

- Requirements of the facility for testing and analyzing wastes, if required, prior to acceptance for treatment and/or disposal (performing facility-required analyses will be at the Contractor's expense); and
- Letters of commitment from the proposed facilities to receive the specific waste from the site.

All soil, debris (excluding the ACZA-treated wood, insulated storage tanks, creosote pipe, spent carbon vessels, 55-gallon drums, and salvageable materials), and items incapable of being decontaminated will be classified as F032, F034, and F035 in accordance with the wood treating waste codes within RCRA. Soil from RA3 and RA12 which exceeded the TCLP criteria for arsenic and chromium will be classified as D004 and D007 hazardous wastes in addition to the F-listing. The ACZA-treated wood which exceeded the TCLP criteria for arsenic will be classified as D004. Table 2-3 lists each removal item with its associated disposal classification and estimated weight. All hazardous waste will be disposed off-site in a RCRA Subtitle C hazardous waste landfill facility. All D-listed hazardous waste will require treatment at a permitted RCRA TSD facility prior to disposal. Landfill disposal will be conducted in accordance with the Phase IV Land Disposal Restrictions: Treatment Standards for Wood Preserving Waste.

Each waste hauling vehicle will be weighed both before and after discharging their contents at the off-site treatment, disposal, and/or recycling facilities, and the Contractor will provide signed receipts of records of weights to the site engineer on a daily basis. The receipts must list the quantities of materials disposed per transport container. The weights recorded at the disposal and/or recycling facilities will be used as the basis for payment of unit price payment items.

2.6 New Site Features

The Contractor will be responsible for reconstruction of the site entrance roadway and reconfiguration of two production wells.

Following excavation and consolidation of one foot of surface soil between the site entrance and the crossing of the Union Pacific Railroad, the Contractor will reconstruct the roadway with 5 inches of asphalt atop a 12-inch gravel base (see Design Plans). The underlying course will be graded and leveled to the satisfaction of the site engineer prior to placement of the crushed rock base course. The base course material will be designated size 0.25 mm - 0 mm (1 inch - 0-inches) conforming to the requirements of Oregon Department of Transportation (ODOT) Standard Specifications. The base will be placed in two 6-inch compacted layers. The Contractor will place 5-inches of asphalt concrete (AC) atop the gravel base. The AC material

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TABLE 2-3
Summary of Disposal Material

McCormick and Baxter Creosoting Co. Site
Portland Plant
Portland, Oregon

Units: Tons

Descriptions	Waste Streams with RCRA Classifications			
	Non-hazardous Solid Waste	Salvaged Steel	Hazardous Waste F032, F034, F035	Hazardous Waste F032, F034, F035, D004, D007
Soil				
Screened Soil from RA 3				803
Screened Soil from RA12				757
Unscreened Soil from RA12				3243
Soil from all other RA Areas*			20095	
Soil in Frac Tanks			128	
Soil Piles			720	
Debris				
AZCA Wood Pile				165
Railroad Steel		618		
Railroad Ties	94		846	
Creosote Coated Metal			10	
94 Pilings			80	
Creosote Dock	400			
Log Loader	200			
3 Poly Storage Tanks	3			
Production well vaults		5		
55-gallon Drums				
45 drums			10	
16 Carbon Vessels			2	
10 Empty Poly Drums	1			
Office Building/Scale House:				
Asbestos	2			
Wood	150			
Metal		12		
Piping:				
Stormwater catch basins/pipe	11			
Creosote piping			106	
TOTALS	862	635	21997	4968

* Includes screened and unscreened soil

Approx. soil weight (tons/cy): 1.6

will meet all applicable requirements for Light Duty AC as specified in ODOT Standard Specifications. The asphalt will be laid in two courses: a 3-inch base course and a 2-inch wearing course.

The Contractor will remove the well vault covers and ancillary piping equipment located within production wells PW-1 and PW-2.. The metal materials will be salvaged at a DEQ approved metal reclamation facility. The concrete vaults will be completely removed and handled as described in Section 2.2, above. New steel casing will be welded onto the existing well riser, extended two feet above the existing ground surface. The vault excavation areas will be backfilled with clean fill to existing grade, and a concrete surface seal will be installed around the new casings for lateral support and to prevent surface water from infiltrating the boreholes. A lockable cap will be installed atop each well, the well will be painted high visibility yellow, and the well name will be permanently stamped onto each well casing.

The remedial construction contractor responsible for implementing the site work described in the plans and specifications will be procured by the State of Oregon's Division of Administrative Services (DAS). It has been assumed that one contractor will be awarded the full contract, however, subcontractors will be utilized for certain tasks (i.e. transportation, demolition, electrical, etc.). A list a mandatory qualifications requirements will be used to establish the minimum standards which a company (or team) must possess in order to be eligible to submit a bid. The qualification criteria will be established by DEQ and DAS with assistance from E & E. The purpose of the mandatory qualification criteria is to ensure that bids are received from companies (or teams) that are capable of delivering the required services. E & E has assumed that the contract will be administered by DEQ and E & E will provide field construction oversight. E & E will not be contractually responsible for the remedial construction contractor. E & E has assumed that all bid advertising and distribution of the contract document will be conducted by DAS. Evaluation of the bids will be conducted by DEQ and DAS with assistance provided by E & E.

At this time, the documents that will be used for bidding and contractual purposes include: Invitation to Bid, Instructions to Bidders, Bid Form(s), Supplements to Bid Forms, Sample Contract, Bonds and Certificates, Insurance Requirements, Wage Rates, and Previous Studies. E & E has assumed that DAS will provide boilerplate versions of these documents which will be adjusted by DEQ and E & E to meet the specific project requirements. Since the EPA is providing funds for the project, Davis Bacon wage rates will apply and will be incorporated into the contract. E & E has assumed that bid bonds, performance bonds, and payment bonds will be required for the project. E & E has assumed that DAS will establish the level of insurance for the project.

E & E has assumed a 120 day bid solicitation, evaluation, and execution period for the contract. Following advertisement and distribution of the contract documents, a mandatory bid walk and follow-up meeting will be held. Any bidder questions that can not be answered during the bid walk or meeting will be noted and responded to in writing. E & E will be responsible for preparing any addenda to the contract documents. The addenda will be issued by DAS. The bid

will be awarded to the lowest, responsive, responsible bidder. The bid form will be composed of various line items identifying the costs for specific project tasks. Unit price and lump sum costs will be primarily used to establish the project costs. E & E will develop the bid form in conjunction with DEQ.

Construction Schedule and Cost Estimate

Table 5-1 presents the remedial action schedule. The schedule is based upon the dates presented in E & E's March 24, 1998 e-mail to DEQ. The duration of site work activity was estimated with the assumption that railroad transportation would be used as the primary transportation mode. E & E has assumed that multiple activities (demolition, concrete removal, soil excavation) would occur simultaneously as deemed necessary by the contractor to complete all remedial activities by the specified completion date.

The Construction Cost Estimate is provided in Appendix A. The estimate has been prepared using MCASES (CostLink version 1.6) cost estimating software in accordance with Task Order requirements. In addition to the MCASES cost database, the following sources of information were utilized to prepare the cost estimate: correct Davis Bacon Wage Rates; RS Means cost estimating references; anonymous discussion with various remedial contractors, disposal facilities, and railroad companies; and engineering judgement.

TABLE 5-1
CONSTRUCTION SCHEDULE
McCormick and Baxter Creosoting Co. Portland Plant

[illegible]

TABLE 5-1
CONSTRUCTION SCHEDULE

Building Systems Design, Inc.; 1996, *CostLink Software v. 1.6*.

Ecology and Environment, Inc. (E & E), 1998, *Revised Final Remedial Design Data Summary Report*, submitted to ODEQ, E & E, Seattle, WA.

United States Environmental Protection Agency and the State of Oregon Department of Environmental Quality (EPA/DEQ), 1998, *Amended Record of Decision*, prepared for McCormick & Baxter Creosoting Site, Portland, Oregon.

_____, 1996, *Record of Decision*, prepared for McCormick & Baxter Creosoting Company, Portland, Oregon.

United States Environmental Protection Agency (EPA), 1995, *Remedial Design/remedial Action handbook* (EPA 540/R-95/059).

PBS Environmental (PBS), 1993, *Asbestos Survey Report for the Former McCormick and Baxter Creosoting Plant, Portland, Oregon*, prepared for PTI Environmental Services, Inc.

APPENDIX A

CONSTRUCTION COST ESTIMATE

Wed 06 May 1998
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PROJECT MACBAC: McCormick and Baxter - Cost Estimate
McCormick and Baxter

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TITLE PAGE 1

McCormick and Baxter
Cost Estimate

Soil Excavation, Demolition, and
Disposal

Designed By: Ecology and Environment, Inc.
Estimated By: Ecology and Environment, Inc.

Prepared By: Kevin Smith, Chad Nancarrow and
Randy Earlywine

Preparation Date: 03/20/98
Effective Date of Pricing: 03/20/98
Est Construction Time: 180 Days

Sales Tax: 0.0%

C o s t L i n k
Software Copyright (c) 1985-1997
by Building Systems Design, Inc.
Release 1.6

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5. Wood transport to rail spur.....10
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5. Load Wood into Rail Cars.....10
10. Add liners and covers.....10
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15. Stabilize Wood (D listed).....11
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DETAILED ESTIMATE	DETAIL PAGE
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No Backup Reports...

★ ★ ★ END TABLE OF CONTENTS ★ ★ ★

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McCormick and Baxter
** PROJECT OWNER SUMMARY - Contract (Rounded to 10's) **

		QUANTY	UOM	CONTRACT	CONTINGN	ESCALATN	TOTAL COST	UNIT
recycled paper	5	Ovehead Items	1.00	EA	319,250	47,890	6,950	374,090 374092
	15	Site Preparation	1.00	EA	157,050	23,560	3,420	184,030 184032
	20	Hazardous Soil Removal/Disposal	1.00	EA	3,443,500	516,520	75,010	4,035,030 4035027
	25	Hazardous Wood Removal/Disposal	1.00	EA	126,640	19,000	2,760	148,390 148391
	28	Hazardous Pipe Removal/Disposal	1.00	EA	65,230	9,790	1,420	76,440 76441
	30	Site Demolition / Disposal	1.00	EA	381,490	57,220	8,310	447,020 447022
	35	Site Clean Up	1.00	EA	34,000	5,100	740	39,840 39838
TOTAL McCormick and Baxter		1.00	EA	4,527,160	679,070	98,610	5,304,840	5304844

SUMMARY PAGE 2

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PROJECT MACBAC: McCormick and Baxter - Cost Estimate
McCormick and Baxter
** PROJECT DIRECT SUMMARY - Contract (Rounded to 10's) **

			QUANTY	UOM	LABOR	EQUIPMNT	MATERIAL	OTHER	TOTAL COST	UNIT
recycled paper	5	Overhead Items	1.00	EA	0	0	219,610	58,100	277,710	277713
	15	Site Preparation	1.00	EA	41,480	16,180	48,960	30,000	136,620	136619
	20	Hazardous Soil Removal/Disposal	1.00	EA	99,900	135,240	69,860	2,690,460	2,995,460	2995464
	25	Hazardous Wood Removal/Disposal	1.00	EA	1,540	3,140	0	105,490	110,160	110160
	28	Hazardous Pipe Removal/Disposal	1.00	EA	1,610	3,280	23,000	28,850	56,750	56747
	30	Site Demolition / Disposal	1.00	EA	9,440	13,240	58,250	250,920	331,850	331854
	35	Site Clean Up	1.00	EA	22,720	5,820	1,040	0	29,570	29575
	TOTAL McCormick and Baxter		1.00	EA	176,700	176,900	420,710	3,163,820	3,938,130	3938132
	Prime's Home Office Expense								236,290	
	SUBTOTAL								4,174,420	
	Prime Contractor's Profit								352,740	
	TOTAL INCL INDIRECTS								4,527,160	
	Contingency								679,070	
	SUBTOTAL								5,206,230	
	Escalation								98,610	
	TOTAL INCL OWNER COSTS								5,304,840	

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Supervision and Management		QUANTITY	UOM	CREW ID	LABOR	EQUIPMNT	MATERIAL	OTHER	TOTAL COST	UNIT
Overhead Items										
Supervision and Management										
Quality Control Engineer		9.00	MON	N/A	0.00 0	0.00 0	4200.00 37,800	0.00 0	4200.00 37,800	4200.00
General Superintendent (P.M.)		12.00	MON	N/A	0.00 0	0.00 0	5300.00 63,600	0.00 0	5300.00 63,600	5300.00
TOTAL Supervision and Management		1.00	EA		0	0	101,400	0	101,400	101400
Office Management										
Office Manager		2.00	MON	N/A	0.00 0	0.00 0	3700.00 7,400	0.00 0	3700.00 7,400	3700.00
Clerks		2.00	MON	N/A	0.00 0	0.00 0	1700.00 3,400	0.00 0	1700.00 3,400	1700.00
Bookkeeper		9.00	MON	N/A	0.00 0	0.00 0	1400.00 12,600	0.00 0	1400.00 12,600	1400.00
Cost Estimator		1.00	MON	N/A	0.00 0	0.00 0	3500.00 3,500	0.00 0	3500.00 3,500	3500.00
TOTAL Office Management		1.00	EA		0	0	26,900	0	26,900	26900
Engineering										
Project Engineer		9.00	MON	N/A	0.00 0	0.00 0	4700.00 42,300	0.00 0	4700.00 42,300	4700.00
TOTAL Engineering		1.00	EA		0	0	42,300	0	42,300	42300
Health and Safety Officer										
Safety Engineer		7.00	MON	N/A	0.00 0	0.00 0	3800.00 26,600	0.00 0	3800.00 26,600	3800.00
30 Ingredients		60.00	EA	N/A	0.00 0	0.00 0	60.15 3,609	0.00 0	60.15 3,609	60.15
Coveralls, Tyvek (Case Of 25) Unit Measure of		60.00	EA	N/A	0.00 0	0.00 0	147.62 8,857	0.00 0	147.62 8,857	147.62
Gloves, Latex (Box Of 100) (Single Hand) Unit Measure Of		60.00	EA	N/A	0.00 0	0.00 0	9.57 574	0.00 0	9.57 574	9.57

Health and Safety Officer			QUANTY	UOM	CREW	ID	LABOR	EQUIPMNT	MATERIAL	OTHER	TOTAL COST	UNIT
recycled paper	Shoe Covers, Tyvek (Bag Of 150 Pr) Unit Measure Of	10.00	EA	N/A			0.00 0	0.00 0	84.03 840	0.00 0	84.03 840	84.03
	Safety Goggles	10.00	EA	N/A			0.00 0	0.00 0	2.49 25	0.00 0	2.49 25	2.49
	Hard-Hats	60.00	EA	N/A			0.00 0	0.00 0	0.00 0	35.00 2,100	35.00 2,100	35.00
	Ear Plugs, Disposable (Box Of 200) Unit Measure	5.00	EA	N/A			0.00 0	0.00 0	21.43 107	0.00 0	21.43 107	21.43
	TOTAL Health and Safety Officer	1.00	EA				0	0	40,613	2,100	42,713	42713
Office Trailors												
ecology and environment	Field Office Trailer (Assume two trailors needed for 6 month's each)	12.00	MOS	N/A			0.00 0	0.00 0	600.00 7,200	0.00 0	600.00 7,200	600.00
	Office Supplies	12.00	MOS	N/A			0.00 0	0.00 0	0.00 0	150.00 1,800	150.00 1,800	150.00
	Temporary Water	6.00	MOS	N/A			0.00 0	0.00 0	0.00 0	250.00 1,500	250.00 1,500	250.00
	Telephone	6.00	MOS	N/A			0.00 0	0.00 0	0.00 0	200.00 1,200	200.00 1,200	200.00
	Power	6.00	MOS	N/A			0.00 0	0.00 0	0.00 0	250.00 1,500	250.00 1,500	250.00
	TOTAL Office Trailors	1.00	EA				0	0	7,200	6,000	13,200	13200
Sanitary Facilities												
ecology and environment	Toilet Portable Chemical (Assume two toilets will be used for 6 months each.	12.00	MO	N/A			0.00 0	0.00 0	100.00 1,200	0.00 0	100.00 1,200	100.00
	TOTAL Sanitary Facilities	1.00	EA				0	0	1,200	0	1,200	1200.00

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Plans	QUANTY	UOM	CREW	ID	LABOR	EQUIPMNT	MATERIAL	OTHER	TOTAL COST	UNIT
Plans										
Health and Safety Plan	1.00	EA			0.00 0	0.00 0	0.00 0	15000.00 15,000	15000.00 15,000	15000
Quality Assurance Plan	1.00	EA			0.00 0	0.00 0	0.00 0	15000.00 15,000	15000.00 15,000	15000
Disposal Plan	1.00	EA			0.00 0	0.00 0	0.00 0	10000.00 10,000	10000.00 10,000	10000
Transportation Plan	1.00	EA			0.00 0	0.00 0	0.00 0	10000.00 10,000	10000.00 10,000	10000
TOTAL Plans	1.00	EA			0	0	0	50,000	50,000	50000
TOTAL Overhead Items	1.00	EA			0	0	219,613	58,100	277,713	277713
Site Preparation										
Road Maintenance										
24' Wide Medium Duty Road With 2 (1512788SW)										
24' Wide Medium Duty Road With Gutter Each Side, Complete.										
Included Are Stripping Of Topsoil (12"), Clearing And Grubbing (Light										
Clearing, Excavation And Fill, 6"Subgrade, 6"Filter ,9" Subbase, 6" Base,										
3"										
Thick Paving,										
Subgrade - Fine Grading +/- .1ft	1665.00	SY	COFGA		0.06 106	0.07 108	0.00 0	0.00 0	0.13 214	0.13
Subgrade Or Subbase Courses	1665.00	SY	COFGA		0.12 201	0.12 205	0.00 0	0.00 0	0.24 406	0.24
With Grader	2000.00	SF	COFGA		0.03 52	0.03 52	0.00 0	0.00 0	0.05 104	0.05
Hand Clean For Asphalt Placing Or Pipe Bedding	2000.00	SF	ULABB		0.15 293	0.00 4	0.00 0	0.00 0	0.15 296	0.15
Large Areas 6 In (150mm) Lift 366 Cy/Hr (280m3/Hr)	1385.00	CY	COFCO		0.10 143	0.33 463	0.00 0	0.00 0	0.44 607	0.44
Large Areas 6 In (150mm) Lift 366 Cy/Hr (280m3/Hr)	280.00	CY	COFCO		0.10 29	0.33 94	0.00 0	0.00 0	0.44 123	0.44
Water For Compaction- 3 Mi (5km) Haul W/3.0m Gal Water Truck	1385.00	CY	COFWI		0.20 281	0.32 449	0.19 264	0.00 0	0.72 994	0.72

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 McCormick and Baxter
 15. Site Preparation

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 DETAIL PAGE 5

Site Surveying	QUANTITY	UOM	CREW ID	LABOR	EQUIPMNT	MATERIAL	OTHER	TOTAL COST	UNIT
Site Surveying									
2 FC-suryr + 4x4 Suburban + Sm (USURA)									
Surveyors, Chief	240.00	HR	FC-SURYC	23.05 5,532	0.00 0	0.00 0	0.00 0	23.05 5,532	23.05
Surveyors	240.00	HR	FC-SURYR	20.15 4,836	0.00 0	0.00 0	0.00 0	20.15 4,836	20.15
Small Tools	240.00	HR	XMIXX020	0.00 0	1.57 377	0.00 0	0.00 0	1.57 377	1.57
TRK,HWY, 8,600GVW,4X4, SUBURBAN	160.80	HR	T50GM005	0.00 0	10.31 1,658	0.00 0	0.00 0	10.31 1,658	10.31
TRK,HWY, 8,600GVW,4X4, SUBURBAN	79.20	HR	T50GM005	0.00 0	1.86 147	0.00 0	0.00 0	1.86 147	1.86
TOTAL Site Surveying	1.00	EA		10,368	2,182	0	0	12,550	12550
Fencing									
6'(1.8M)H Fabric Security Fence Standard FE-6	1350.00	LF	ULABC	0.70 951	0.01 14	10.67 14,400	0.00 0	11.38 15,364	11.38
6'(1.8M) High Sliding Gate	40.00	LF	ULABN	14.89 596	13.24 530	30.00 1,200	0.00 0	58.13 2,325	58.13
TOTAL Fencing	1.00	EA		1,546	543	15,600	0	17,690	17690
Decontamination									
Hot Water, Gasoline, 3200PSI, 4.2GPM, 11HP (Monthly Rental) Includes Trailer	2.00	EA	N/A	0.00 0	0.00 0	1376.00 2,752	0.00 0	1376.00 2,752	1376.00
Decontamination Spot Washing Small Crew	200.00	DAY	HDECA	73.21 14,641	0.79 158	0.00 0	0.00 0	73.99 14,799	73.99
TOTAL Decontamination	1.00	EA		14,641	158	2,752	0	17,551	17551

Decontamination Pad		QUANTITY	UOM	CREW ID	LABOR	EQUIPMNT	MATERIAL	OTHER	TOTAL COST	UNIT
Decontamination Pad										
recycled paper	Slab On Grade Is 6in Thick 3000 (0131001MW)									
	Slab On Grade Is 6in Thick 3000 Psi Concrete Reinforced With 6X6 -									
	W2.8 X W2.8 Wire Mesh Vapor Barrier And Gravel Base. Saw Cut Joint									
	S And Contraction Joints Are Spaced 20Ft On Center.									
	1/2 Cy, 75 Cy/Hr (58 M3)	95.25	CY	CODEA	0.57 54	0.63 60	0.00 0	0.00 0	1.20 114	1.20
	Capillary Water Barrier 4 In Compacted Thickness	48.00	CY	CODEK	1.40 67	0.29 14	12.30 590	0.00 0	13.99 672	13.99
	Up To 6 In (150mm) High	63.00	LF	ACARJ	1.09 69	0.03 2	0.27 17	0.00 0	1.39 88	1.39
	#3 - #6, Grade 60	0.25	TON	SIWRC	351.86 88	3.16 1	394.00 99	0.00 0	749.01 187	749.01
	6 X 6 #6 @ 42 Lb/Csf, (w 2.9 X W 2.9)	5289.75	SF	SIWRB	0.19 1,002	0.00 8	0.09 476	0.00 0	0.28 1,486	0.28
	Neoprene Sponge, 1/2 In X 6 In	160.50	LF	ACARA	0.61 98	0.01 2	2.35 377	-0.00 0	2.97 477	2.97
	30 Lb Felt	45.25	SF	ACARA	0.23 10	0.00 0	0.06 3	0.00 0	0.29 13	0.29
	Burlap, 4 Uses 7.5 Oz	2519.00	SF	ULABB	0.05 115	0.00 2	0.05 115	0.00 0	0.09 231	0.09
	Equal Or Greater Than 6 In (150mm), Placed By Crane And	48.00	CY	ALABG	7.46 358	4.00 192	47.15 2,263	0.00 0	58.61 2,813	58.61
	Steel Trowel	2519.00	SF	ACMAC	0.33 822	0.02 55	0.00 0	0.00 0	0.35 877	0.35
ecology and environment	.006 In Thick	2644.75	SF	ACARA	0.06 164	0.00 3	0.02 47	0.00 0	0.08 214	0.08
	2 In Urethane, R14.3	113.25	SF	ACARA	0.31 35	0.00 1	1.16 131	0.00 0	1.47 167	1.47
	TOTAL Decontamination Pad	1.00	EA		2,883	338	4,118	0	7,339	7338.75

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Mobilization and Demobilization	QUANTITY	UOM	CREW ID	LABOR	EQUIPMNT	MATERIAL	OTHER	TOTAL COST	UNIT
Mobilization and Demobilization									
Mobilization and Demobilization				0.00	0.00	0.00	30000.00	30000.00	
	1.00	EA		0	0	0	30,000	30,000	30000
TOTAL Mobilization and Demobilization	1.00	EA		0	0	0	30,000	30,000	30000
TOTAL Site Preparation	1.00	EA		41,482	16,181	48,956	30,000	136,619	136619
Hazardous Soil Removal/Disposal									
Excavate Soil									
Excavate Contam Soil Includes excavation, and stockpiling	18350	CY	CODEO	1.44	2.48	0.00	0.00	3.92	
				26,363	45,508	0	0	71,871	3.92
10 mil base liner for stockpile Calculated to be 9.93	29360	TON	ULABK	0.75	0.07	1.50	0.00	2.33	
				22,164	2,176	44,040	0	68,379	2.33
Berm Soil for Stockpile Calculated to be 0.08 cy of berm soil needed per 1 ton of contaminated soil. The unit of measure is for the contaminated soil.	29360	TON	COFCI	0.03	0.07	0.32	0.00	0.41	
				752	2,020	9,395	0	12,167	0.41
Sandbags for Stockpile: Calculated to be 0.22 ea of	29360	TON	ULABI	0.13	0.03	0.30	0.00	0.46	
				3,770	828	8,808	0	13,406	0.46
TOTAL Excavate Soil	1.00	EA		53,049	50,531	62,243	0	165,823	165823
Transport Soil to Rail Spur									
12 LCY Truckload, 20 MPH 2 Cycles/Hr	16100	CY	COEID	0.31	0.97	0.00	0.00	1.27	
				4,930	15,556	0	0	20,486	1.27
Exc & Ld, 3-1/2CY Wh Ldr, Lt Matl 155 CY/Hr (118M3)	16100	CY	CODLI	0.15	0.36	0.00	0.00	0.51	
				2,360	5,791	0	0	8,151	0.51
TOTAL Transport Soil to Rail Spur	1.00	EA		7,290	21,347	0	0	28,637	28637
Sieve Soil									
Quote provided by ADT . Price includes 4 pieces of equipment (Sieve, Loader, Track Hoe and Dump Truck)									
Sieve Soil Excavations				0.00	0.00	0.00	4.40	4.40	
	11860	TON		0	0	0	52,184	52,184	4.40

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Sieve Soil		QUANTITY	UOM	CREW	ID	LABOR	EQUIPMNT	MATERIAL	OTHER	TOTAL COST	UNIT
recycled paper	TOTAL Sieve Soil	1.00	EA			0	0	0	52,184	52,184	52184
	Field Screen										
	Assume \$35 per sample										
	Field Screening of Remedial Action Areas	2000.00	EA			0.00 0	0.00 0	0.00 0	35.00 70,000	35.00 70,000	35.00 35000
	TOTAL Field Screen	1.00	EA			0	0	0	70,000	70,000	70000
Confirmation Sampling											
Analytical Costs are based on previous sampling events at the site.											
	Confirmation Sampling	200.00				0.00 0	0.00 0	0.00 0	250.00 50,000	250.00 50,000	250.00
	TOTAL Confirmation Sampling	1.00	EA			0	0	0	50,000	50,000	50000
Dust Suppression											
	Watering By Truck	10000	MSF	COFWI		0.54 5,431	0.93 9,271	0.00 0	0.00 0	1.47 14,702	1.47
	TOTAL Dust Suppression	1.00	EA			5,431	9,271	0	0	14,702	14702
Pit Dewatering											
	Port. Water Pump, 2", 10000 GPH Gas Powered, w/Wheels	40.00	HR	MSPFB		65.89 2,636	1.13 45	190.35 7,614	0.00 0	257.36 10,295	257.36
	TOTAL Pit Dewatering	1.00	EA			2,636	45	7,614	0	10,295	10295
ecology and environment	Transport Soil Off-Site										
	Load Soil into Rail Cars										
	Load Soil into rail cars 1 Gondola capacity = 95 Tons	16100	CY	CODEO		0.72 11,566	1.24 19,966	0.00 0	0.00 0	1.96 31,532	1.96
	Add Liners,Covers to Rail Cars										
Quote obtained from Mid America Railway Supply Inc.											
	Add liners and covers to rail cars	272.00	EA			0.00 0	0.00 0	0.00 0	500.00 136,000	500.00 136,000	500.00

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Transport Soil Off-Site	QUANTY	UOM	CREW	ID	LABOR	EQUIPMNT	MATERIAL	OTHER	TOTAL COST	UNIT
Transport Soil to Landfill										
Transport soil via rail. Quote obtained from Union Pacific Railroad. Includes 5190 cy of soil from 1 foot excavations, 10380 cy from 4 foot excavations, 80 cy of soil in Frac tanks and 450 cy of soil in soil piles.	272.00	EA			0.00 0	0.00 0	0.00 0	850.00 231,200	850.00 231,200	850.00
TOTAL Transport Soil Off-Site	1.00	EA			11,566	19,966	0	367,200	398,732	398732
Stabilize Soil (D listed)										
Stabilize and Dispose of D Listed Waste. Quote provided by Chemical Waste Management - Price includes Stabilization, Disposal and Tax	4810.00	TON			0.00 0	0.00 0	0.00 0	107.50 517,075	107.50 517,075	107.50
TOTAL Stabilize Soil (D listed)	1.00	EA			0	0	0	517,075	517,075	517075
Disposal of Soil (F listed)										
Disposal of F listed Soil. Quote provided by Chemical Waste Management - price includes disposal costs and tax.	21000	TON			0.00 0	0.00 0	0.00 0	75.00 1,575,000	75.00 1,575,000	75.00
TOTAL Disposal of Soil (F listed)	1.00	EA			0	0	0	1,575,000	1,575,000	1575000
Backfill Excavations										
Off-site Backfill Delivered										
Off-Site Backfill Quote Provided by Ross Island	11800	CY			0.00 0	0.00 0	0.00 0	5.00 59,000	5.00 59,000	5.00
Placement of Backfill										
Exc & Ld, 3-1/2CY Wh Ldr, Lt Matl 155 CY/Hr (118M3)	20000	CY	CODLI		0.15 2,932	0.36 7,194	0.00 0	0.00 0	0.51 10,126	0.51
12 LCY Truckload, 20 MPH 1.6 Cycles/Hr	20000	CY	COEID		0.20 4,082	0.64 12,882	0.00 0	0.00 0	0.85 16,964	0.85

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Backfill Excavations		QUANTY	UOM	CREW ID	LABOR	EQUIPMNT	MATERIAL	OTHER	TOTAL COST	UNIT
recycled paper	Spread Borrow w/Dozer	20000	CY	CODTE	0.22 4,464	0.54 10,788	0.00 0	0.00 0	0.76 15,252	0.76
	Compaction of Backfill									
	Compaction by 5 Ton Steel Wheel Tandem Roller	20000	CY	COFCA	0.42 8,454	0.16 3,220	0.00 0	0.00 0	0.58 11,674	0.58
	TOTAL Backfill Excavations	1.00	EA		19,932	34,084	0	59,000	113,016	113016
	TOTAL Hazardous Soil Removal/Disposal	1.00	EA		99,904	135,244	69,857	2,690,459	2,995,464	2995464
Hazardous Wood Removal/Disposal										
Wood transport to rail spur										
Includes 165 tons of ACZA stockpiled wood 846 tons of railroad ties, and 80 tons of pilings										
Conversion =1.6 tons per CY										
ecology and environment	12 LCY Truckload, 20 MPH 1.6 Cycles/Hr	700.00	CY	COEID	0.61 429	1.82 1,271	0.00 0	0.00 0	2.43 1,700	2.43
	Exc & Ld, 3-1/2CY Wh Ldr, Lt Matl 155 CY/Hr (118M3)	700.00	CY	CODLI	0.15 103	0.34 238	0.00 0	0.00 0	0.49 341	0.49
	TOTAL Wood transport to rail spur	1.00	EA		531	1,509	0	0	2,040	2040.29
	Transport Off-site									
	Load Wood into Rail Cars									
ecology and environment	Load wood into rail cars	700.00	CY	CODEO	1.44 1,006	2.32 1,627	0.00 0	0.00 0	3.76 2,633	3.76
	Add liners and covers									
	Add liners and covers to Rail car	13.00			0.00 0	0.00 0	0.00 0	500.00 6,500	500.00 6,500	500.00
	Transport Wood via Rail									
	Transport Wood Via Rail Quote provided by UPRR	13.00	EA		0.00 0	0.00 0	0.00 0	850.00 11,050	850.00 11,050	850.00
TOTAL Transport Off-site		1.00	EA		1,006	1,627	0	17,550	20,183	20183

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 25. Hazardous Wood Removal/Disposal

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Stabilize Wood (D listed)	QUANTY	UOM	CREW ID	LABOR	EQUIPMNT	MATERIAL	OTHER	TOTAL COST	UNIT
Stabilize Wood (D listed)									
Stabilize Wood and disposal				0.00	0.00	0.00	107.50	107.50	
	165.00			0	0	0	17,738	17,738	107.50
TOTAL Stabilize Wood (D listed)	1.00	EA		0	0	0	17,738	17,738	17738
Disposal of Wood (F-listed)									
Disposal of F listed wood and metal.				0.00	0.00	0.00	75.00	75.00	
	936.00	TON		0	0	0	70,200	70,200	75.00
TOTAL Disposal of Wood (F-listed)	1.00	EA		0	0	0	70,200	70,200	70200
TOTAL Hazardous Wood Removal/Disposal	1.00	EA		1,537	3,136	0	105,488	110,160	110160
Hazardous Pipe Removal/Disposal									
Hazardous Pipe Removal									
Trenching using proprietary HDSI Trencher				0.00	0.00	25.00	10.00	35.00	
	920.00	LF	N/A	0	0	23,000	9,200	32,200	35.00
TOTAL Hazardous Pipe Removal	1.00	EA		0	0	23,000	9,200	32,200	32200
Transport Haz Pipe to rail spur									
12 LCY Truckload, 20 MPH 1.6 Cycles/Hr				1.28	4.05	0.00	0.00	5.34	
	170.00	CY	COEID	218	689	0	0	907	5.34
Exc & Ld, 3-1/2CY Wh Ldr, Lt Matl 155 CY/Hr (118M3)				1.51	3.72	0.00	0.00	5.23	
	170.00	CY	CODLI	258	632	0	0	889	5.23
TOTAL Transport Haz Pipe to rail spur	1.00	EA		476	1,321	0	0	1,797	1796.59
Disposal of Hazardous Piping									
Load pipe into Rail Cars Also included is 10 tons of Cresote Coated Metal				5.99	10.33	0.00	0.00	16.32	
	190.00	CY	CODEO	1,137	1,963	0	0	3,101	16.32
Add liners and Covers to Rail Cars				0.00	0.00	0.00	500.00	500.00	
	5.00	EA		0	0	0	2,500	2,500	500.00
Transport Piping Via Rail				0.00	0.00	0.00	850.00	850.00	
	5.00	EA		0	0	0	4,250	4,250	850.00

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Disposal of Hazardous Piping		QUANTITY	UOM	CREW	ID	LABOR	EQUIPMNT	MATERIAL	OTHER	TOTAL COST	UNIT
recycled paper	Stabilization and disposal of piping	120.00	TON			0.00 0	0.00 0	0.00 0	107.50 12,900	107.50 12,900	107.50
	TOTAL Disposal of Hazardous Piping	1.00	EA			1,137	1,963	0	19,650	22,751	22,751
	TOTAL Hazardous Pipe Removal/Disposal	1.00	EA			1,613	3,284	23,000	28,850	56,747	56,747
Site Demolition / Disposal											
Railroad Tracks											
	Railroad Track Demolition Quote provided by MRC Company Price includes demolition of rail track system, stockpiling of all rail ties, and contractor retaining all salvage rights to steel.	1.00	EA			0.00 0	0.00 0	0.00 0	25000.00 25,000	25000.00 25,000	25000
	TOTAL Railroad Tracks	1.00	EA			0	0	0	25,000	25,000	25000
Concrete Slabs Quote provided by Allied Demolition											
	Excavate concrete and place into pits. Quote provided by Allied Demolition.	1320.00	CY			0.00 0	0.00 0	0.00 0	10.10 13,332	10.10 13,332	10.10
	TOTAL Concrete Slabs	1.00	EA			0	0	0	13,332	13,332	13332
Office Building Quote provided by Allied Demolition during phase I demolition activity in April 1997. Price includes demolition, asbestos abatement and disposal of all materials associated with the office building.											
ecology and environment		1.00	EA			0.00 0	0.00 0	0.00 0	61110.00 61,110	61110.00 61,110	61110
	TOTAL Office Building	1.00	EA			0	0	0	61,110	61,110	61110
Production Wells											
	Vault Demolition and Well Head Reconstruction	2.00	EA			3000.00 6,000	2000.00 4,000	10000.00 20,000	1000.00 2,000	16000.00 32,000	16000

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Production Wells	QUANTITY	UOM	CREW ID	LABOR	EQUIPMNT	MATERIAL	OTHER	TOTAL COST	UNIT
TOTAL Production Wells	1.00	EA		6,000	4,000	20,000	2,000	32,000	32000
Drum Disposal									
Drum transportation and disposal Quote provided by Chem Waste Management.	45.00	EA		0.00 0	0.00 0	0.00 0	170.00 7,650	170.00 7,650	170.00
TOTAL Drum Disposal	1.00	EA		0	0	0	7,650	7,650	7650.00
Storage Tanks Engineering Judgement									
Demolition and removal of Poly Storage Tanks	3.00	EA		0.00 0	0.00 0	0.00 0	4000.00 12,000	4000.00 12,000	4000.00
TOTAL Storage Tanks	1.00	EA		0	0	0	12,000	12,000	12000
Storm Water Piping Removal									
Trenching for storm sewer pipe removal	1530.00	LF	N/A	0.00 0	0.00 0	25.00 38,250	0.00 0	25.00 38,250	25.00
Disposal of Piping	15.00	TON		0.00 0	0.00 0	0.00 0	98.39 1,476	98.39 1,476	98.39
TOTAL Storm Water Piping Removal	1.00	EA		0	0	38,250	1,476	39,726	39726
Creosote Dock Demolition Quote provided by Wilder Construction - Price includes demolition of creosote dock and stockpiling of material on-shore.									
Demolition of Creosote Dock	1.00	EA		0.00 0	0.00 0	0.00 0	58500.00 58,500	58500.00 58,500	58500
TOTAL Creosote Dock Demolition	1.00	EA		0	0	0	58,500	58,500	58500
Landslide Material Landslide Material shall be used as site backfill									
Excavate Landslide material and use as backfill on-site.	3500.00	CY	CODLI	0.15 513	0.34 1,190	0.00 0	0.00 0	0.49 1,703	0.49

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Landslide Material		QUANTITY	UOM	CREW ID	LABOR	EQUIPMNT	MATERIAL	OTHER	TOTAL COST	UNIT
recycled paper	12 LCY Truckload, 20 MPH 1.6 Cycles/Hr	3500.00	CY	COEID	0.61 2,143	1.82 6,355	0.00 0	0.00 0	2.43 8,498	2.43
	Spread Borrow w/Dozer	3500.00	CY	CODEE	0.22 781	0.48 1,696	0.00 0	0.00 0	0.71 2,478	0.71
	TOTAL Landslide Material	1.00	EA		3,437	9,242	0	0	12,679	12679
Non-Hazardous Debris Disposal										
Quote used from actual Phase I demolition costs (Allied Demolition)										
Material included:										
94 Tons railroad ties										
466 Tons Wood (Creosote Dock)										
299 Tons Wood (Log Loader)										
	Transportation/Disposal of Non-Haz Debris. Price for this item was based on phase 1 demolition costs from Allied Demolition.	710.00	TON		0.00 0	0.00 0	0.00 0	98.39 69,857	98.39 69,857	98.39
	TOTAL Non-Hazardous Debris Disposal	1.00	EA		0	0	0	69,857	69,857	69857
	TOTAL Site Demolition / Disposal	1.00	EA		9,437	13,242	58,250	250,925	331,854	331854
Site Clean Up										
Site Regrade										
	Site Debris Clean-Up & Removal	45.00	AC	COETF	84.85 3,818	87.95 3,958	0.00 0	0.00 0	172.80 7,776	172.80
	TOTAL Site Regrade	1.00	EA		3,818	3,958	0	0	7,776	7776.17
ecology and environment	Mechanical Seeding, 450#/Acre	45.00	ACR	ULABE	420.09 18,904	41.31 1,859	23.00 1,035	0.00 0	484.41 21,798	484.41
	TOTAL Hydroseed	1.00	EA		18,904	1,859	1,035	0	21,798	21798
	TOTAL Site Clean Up	1.00	EA		22,722	5,817	1,035	0	29,575	29575
	TOTAL McCormick and Baxter	1.00	EA		176,696	176,904	420,711	3,163,821	3,938,132	3938132